CLAIMS

What is claimed is:

1. A charge-transfer chemical sensor comprising:

a sol-gel material affixable to a predetermined surface, and indicating means within said sol-gel for detecting and signaling a presence of at least one chemical.

2. The sensor according to claim 1, wherein said indicating means includes colorimetric signal means for signaling the presence of at least one chemical.

3. The sensor according to claim 2, wherein said signal means is selected from the group consisting essentially of an indicator with Cu (II), an indicator with a Lewis acid, Cu^{2+}/PEDTA, CuZnSOD, Ni^{2+}/dimethylglyoxime, thymol blue/Fichlor, thymol blue/sarinase, thymol blue/somanase, and thymol blue/parathion hydrolase.

4. The sensor according to claim 1, wherein said sol-gel is an optically transparent xerogel.

5. The sensor according to claim 1, wherein the chemical being detected is selected from the group consisting essentially of chemical warfare agents, agricultural pesticides, and insecticides.

6. An indicator for detecting and indicating a presence of at least one chemical, said indicator comprising:

a sol-gel material affixable to a predetermined surface, and indicating means within said sol-gel for detecting and signaling a presence

of at least one chemical.

7. The indicator according to claim 6, wherein said indicating means includes colorimetric signal means for signaling the presence of at least one chemical.

8. The indicator according to claim 7, wherein said signal means is selected from the group consisting essentially of an indicator with Cu (II), an indicator with a Lewis acid, Cu^{2+}/PEDTA, CuZnSOD, Ni^{2+}/dimethylglyoxime, thymol blue/Fichlor, thymol blue/sarinase, thymol blue/somanase, and thymol blue/parathion hydrolase.

9. The indicator according to claim 6, wherein said sol-gel is an optically transparent xerogel.

10. The indicator according to claim 6, wherein the chemical being detected is selected from the group consisting essentially of chemical warfare agents, agricultural pesticides, and insecticides.

11. A method of detecting a presence of at least one chemical by:

applying the detector of claim 6 to a predetermined surface of an object; and

indicating on the detector the presence of at least one chemical.

12. A method of making a chemical sensor by:

encapsulating within a sol-gel a detector capable of detecting and signaling a presence of at least one chemical.

13. A decontaminating agent for removing contaminants from an area, said decontaminating agent comprising:

a sol-gel material affixable to a predetermined surface, and decontaminating means having an affinity for the contaminants within said sol-gel for decontaminating at least one chemical present in the area.

14. The decontaminating agent according to claim 13, wherein said decontaminating means is at least one nanoparticle heterogeneous catalyst.

15. The decontaminating agent according to claim 14, wherein said at least one nanoparticle heterogeneous catalyst is selected from the group consisting essentially of Ce^{4+}/zirconia, Zr^{4+}/zirconia, and Th^{4+}/zirconia.

16. The decontaminating agent according to claim 13, wherein said sol-gel is an optically transparent xerogel.

17. The decontaminating agent according to claim 13, wherein the chemical being decontaminated is selected from the group consisting essentially of chemical warfare agents, agricultural pesticides, and insecticides.